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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/709,923	06/07/2004	Min-Lung Huang	10788-US-PA	3922

31561 7590 11/14/2005

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER	
CHAMBLISS, ALONZO	
ART UNIT	PAPER NUMBER
2814	

DATE MAILED: 11/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/709,923	HUANG ET AL.	
	Examiner	Art Unit	
	Alonzo Chambliss	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *6-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 6-14 in the reply filed on 9/9/05 is acknowledged. Claims 1–5 have been cancelled.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

3. The formal drawings filed on 6/7/04 have been approved by the examiner.

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: " METHOD OF FABRICATING FLIP CHIP PACKAGE SUBSTRATE ".

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 6-8, 10, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuyama et al. (US 6,689,639) in view of Beddingfield et al. (US 5,710,071).

With respect to Claims 6 and 14, Sakuyama discloses providing a substrate 10 having a first surface and an opposite second surface, wherein the substrate 10 includes a plurality of first contacts 11,71 on the first surface of the substrate 10 and wherein the first contacts are electrically connected to the second contacts. A plurality of bumps 41 on the first surface of the substrate 10, wherein each bump 41 is connected to one first contact 11,71. A chip (i.e. X) having a plurality of bonding pads 11,71 corresponding to the bumps 41, wherein a metal layer 20 (i.e. made of a nickel layer formed by electroless plating) is disposed on surfaces of the bonding pads 11,71. Arranging the chip (i.e. X) onto the first surface of the substrate 10 by flipping the chip, so that the bonding pads are connected to the bumps 41 and reflowing the bumps 41 (see col. 1 lines 11-24, col. 4 lines 59-65, col. 6 lines 22-67, and col. 7 lines 5-55; Figs.

2A-2D, 3A-3C, and 5). Sakuyama fails to disclose a plurality of second contacts on the second surface of the substrate. However, Beddingfield discloses a plurality of first contacts on the first surface and a plurality of second contacts on the second surface of the substrate (see col. 4 lines, col. 5 lines 22-41 and col. 9 lines 34-42; Figs. 4-6, 8, and 12). Thus, Sakuyama and Beddingfield have substantially the same environment of chip attached to a substrate by bumps. Therefore, one skilled in the art at the time of the invention would readily recognize incorporating a plurality of second contacts on the second surface of the substrate of Sakuyama, since the second contacts would facilitate the attachment of the substrate to an circuit board as taught by Beddingfield.

With respect to Claims 7 and 8, Beddingfield discloses disposing a plurality of solder balls or pins on the second surface of the substrate, wherein the solder balls or pins are connected to the second contacts (see col. 5 lines 34-41).

With respect to Claim 10, Sakuyama discloses forming the bumps comprises printing a tin paste onto surfaces of the first contacts and reflowing the tin paste (see col. 2 lines 4-30 and col. 7 lines 38-45).

With respect to Claim 13, Sakuyama discloses filling an underfill material 72 between the chip and the substrate, wherein the underfill material covers the bumps (see Fig. 5).

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuyama et al. (US 6,689,639) and Beddingfield et al. (US 5,710,071) as applied to claim 1 above, and further in view of Acocella et al. (US 5,591,941).

With respect to Claim 9, Sakuyama-Beddingfield discloses the claimed invention except for forming the bumps comprising implanting tin globes and treating surfaces of the first contacts with a flux before implanting tin globes (see col. 5 lines 20-59; Fig. 5). Thus, Sakuyama-Beddingfield and Acocella have substantially the same environment of bumps formed on a substrate. Therefore, one skilled in the art at the time of the invention would readily recognize incorporating a flux on the first contact pad of Sakuyama-Beddingfield, since the flux would facilitate connection between the bump and the contact pad as taught by Acocella.

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuyama et al. (US 6,689,639) and Beddingfield et al. (US 5,710,071) as applied to claim 1 above, and further in view of Gansauge et al. (US 5,244,833).

With respect to Claim 11, Sakuyama-Beddingfield discloses the claimed invention except for forming the bumps on surface of the first contacts by electroplating, thus forming the bumps on the substrate without reflowing. However, Gansauge discloses forming the bumps on surface of the first contacts by electroplating, thus forming the bumps on the substrate without reflowing (see col. 4 lines 7-13 and col. 5 lines 40-45). Thus, Sakuyama-Beddingfield and Gansauge have substantially the same environment of bumps formed on a substrate. Therefore, one skilled in the art at the time of the invention would readily recognize substitute a electroplating process for process used by Sakuyama-Beddingfield to form the bumps, since the electroplating process would facilitate connection between the bump and the contact pad as taught by Gansauge.

9. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuyama et al. (US 6,689,639) and Beddingfield et al. (US 5,710,071) as applied to claim 1 above, and further in view of Benenati et al. (US 6,177,729).

With respect to Claim 12, Sakuyama-Beddingfield discloses the claimed invention except for an adhesive layer formed on the surfaces of the bonding pads of the chip before the chip is arranged to the substrate, and wherein after the chip is arranged to the substrate, the adhesive layer wraps around the bumps. However, Benenati discloses an adhesive layer 22 or 38 formed on the surfaces of the bonding pads 24 of the chip 26 before the chip 26 is arranged to the substrate 28, and wherein after the chip 26 is arranged to the substrate 28, the adhesive layer 22 or 38 wraps around the bumps 20 (see col. 4 lines 1-67 and col. 5 lines 1-14; Figs. 1, 3a-3c, 5a, 5c, 6a, 6b, and 8). Thus, Sakuyama-Beddingfield and Benenati have substantially the same environment of a chip attached to a substrate by bumps. Therefore, one skilled in the art at the time of the invention would readily recognize incorporating an adhesive to the contact of the chip of Sakuyama-Beddingfield, since the adhesive would facilitate connection between the bump and the contact pad of the chip as taught by Benenati.

The prior art made of record and not relied upon is cited primarily to show the process of the instant invention.

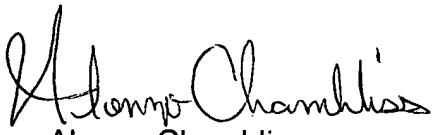
Conclusion

10. Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (571)

272-1927.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system Status information for published applications may be obtained from either Private PMR or Public PMR. Status information for unpublished applications is available through Private PMR only. For more information about the PMR system see http://pair-dkect.uspto.gov. Should you have questions on access to the Private PMR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or EBC_Support@uspto.gov.



Alonzo Chambliss
Primary Patent Examiner
Art Unit 2814

AC/November 8, 2005